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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
ABRAMS, NEIL				
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/564,200

Filing Date: January 11, 2006

Appellant(s): KARIYA ET AL.

EDWIN D. GARLEPP  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11/26/2010 appealing from the Office action mailed 01/25/2010.

**(1) Real Party in Interest**

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

The following is a list of claims that are rejected and pending in the application:

Claims 1-3, 5-22 are pending and stand rejected.

**(4) Status of Amendments After Final**

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

**(5) Summary of Claimed Subject Matter**

The examiner has no comment on the summary of claimed subject matter contained in the brief.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN

REJECTIONS.” New grounds of rejection (if any) are provided under the subheading “NEW GROUNDS OF REJECTION.”

**(7) Claims Appendix**

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant’s brief.

**(8) Evidence Relied Upon**

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

4,667,219	Lee	5-1987
4,825,284	Soga	4-1989
6,204,563	Ohuchi	3-2001
6,452,807	Barrett	9-2002
6,516,513	Milkovich	2-2003
6,670,699	Mikubo	12-2003
6,828,666	Herrell	12-2009

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 5-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohuchi in view of Herrell, Barrett, Lee, Soga, Mikubo and Milkovich.

For claims, 1, 11, Ohuchi, figure 1, includes an interposer 3 to be located between a substrate 9 and an IC chip 1, the interposer including an insulative base material having in one case a Youngs modulus of 10, 000 Kg/mm<sup>2</sup> which is about 98 GPa and is depicted to have a

thickness that appears to clearly be within the recited ratio of 0.05 to 1.5 times the thickness of the substrate 9 and also to have a plurality of holes 6 that include conductors for connecting the substrate 9 and chip.

Ohuchi lacks disclosure of the holes in the recited diameter range and of the holes being in form of a grid or for claim 11, lacks disclosure of a staggered grid. The use of grids for interposer holes including staggered grids is shown in Barrett, figures 1, 2, Lee, figures 4, 4A, 9 and Herrell, figures 2, 4. Obvious to use such grid feature in Ohuchi and for claim 11 to use a staggered grid. With these arrangements a larger numbers of circuit paths is possible. As to hole size it would have been obvious to select the smallest hole size necessary to achieve the desired current. So applied, Ohuchi in fully adequate for claims 1 and 11.

In addition, for the hole size feature, note Milkovich column 6, lines 65-67, reference to "4 mils" for size of pads at ends of holes, the holes then likely having diameter in range of about 2 to 3 mils. With the conversion factor being 1 mil equals 25 micron, 4 mils is about equal to 100 micron hence falls within the recited claims 1, 11 range. It would have been obvious to form the Ohuchi hole size at such 100 micron diameter to minimize size of the assembly.

As to insulation base thickness limitations while Ohuchi is seen entirely sufficient, interposer bases within recited range are also shown in Herrell, figure 1 at 113, Soga at 9, Barrett at 10 and Mikubo at 3. Also obvious should the matter be at issue, to use such relationships for Ohuchi interposer base since that appears to be a standard way to form such interposer to optimize performance of the assembly. In case any issue arises as to use of the Ohuchi interposer, it is also submitted that it would necessarily function to transmit currents in the manner clearly taught by Soga at 9, 11, Barrett at 10, 18 and Milkovich figure 6.

In the last response, no arguments are presented for claims 2, 3, 5-7, 9-16, 18, 19 and these do not appear to be at issue, however, for clarification of the record, the following is stated. Claims 2, 4, 12, and 14, relate only to features of the substrate and not of the interposer, hence cannot be relied upon to avoid the rejection.

For claims 9, 18 and as alternative for claims 2, 5, 12, 14 Ohuchi lacks multilayer substrate. Mikubo at 6 includes such type substrate. Obvious to use such features in place of 9 of Ohuchi to enable greater number of circuit connections.

For claims 6, 7, 15, 16 also obvious to provide Ohuchi base with plated holes or holes filled with solder (paste) in view of Milkovich at 11, 10 to provide good conductivity through the interposer.

For claim 20, Ohuchi lacks ground or power vias. Herrell at 121, 122 and Lee at 72 includes such features. Obvious to include such type vias in Ohuchi interposer to enable proper operation of the IC 1.

For claims 21, 22, Ohuchi modified as discussed above is adequate.

In addition, to above discussion, it has been held that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 225 (CCPA 1955).

In this case where the patent to Ohuchi discloses the "general conditions" of the claims 1, 11, interposer, the selection by applicant of particular ranges for base thickness and for hole diameter are seen to be obvious variations of the Ohuchi interposer teachings.

**(10) Response to Argument**

Applicant's arguments filed in the Appeal Brief have been fully considered but they are not persuasive. All arguments appear directed to claims 1 and 11. In response the Examiner submits that the claims 1, 11 limitations of a "0.05 to 1.5" thickness ratio is seen as very broad to cover almost all standard arrangements of interposer and substrates. Therefore references teachings even if not to scale should be adequate. Nor do applicants assert that such relationship or that the recited "hole size range" are not typical in the art. The grid and "staggered grid" features are also seen to be standard expedient for ICs and interposers, even apart from cited references.

As to the base material "thickness" limitation, appellant on pages 3, 4, argues that the Ohuchi figures and those of other patents applied are "not to scale".

In response note that the base thickness limitations of claims 1 and 11 is so broad as to cover a range of extremely thin to extremely thick a dimensional factor of 30 and is believed to cover the vast majority of interposers in use. Also note that Ohuchi as well as Herrell, Soga, Barrett and Mikubo, all show interposers that as depicted, fall well within the recited range.

In such a case, the assertion of "not to scale" by itself should not avoid the rejection.

As to arguments on page 7 with respect to hole diameter, the Milkovich patent discloses on interposer with vias used to transmit current in a manner much like that of the Ohuchi interposer. Therefore the Milkovich teachings are seen to be pertinent and to be properly applied.

In addition to use of patent drawings for base thickness and Milkovich patent as applied above, it is also submitted that with the basic interposer features and manner of use taught by

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Ohuchi, the selection of a base thickness and of hole diameter would have been matters of selection of optimum parameters that do not provide patentable distinction over the prior art.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Neil Abrams/  
Primary Examiner, Art Unit 2839

Conferees:

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/T. C. P./  
Supervisory Patent Examiner, Art Unit 2839

David Martin  
/David S Martin/  
Examiner, OPQA

Any inquiry concerning this communication should be directed to Neil Abrams at telephone number 571-272-2089.